REMARKS

Claims 1-30 will be pending upon entry of the present amendment. Claims 9 and 10 are amended, and new claim 30 is submitted herewith. No new matter has been added to the application.

Claim 9 has been amended to recite an output terminal, and also to recite the first and second comparison means supplying the selected logic value at the output terminal. Claim 10 has been amended to recite "supplying a selected logic value at an output terminal," and new claim 30, which depends from independent claim 1, recites an output terminal. Support for these amendments can be found in the specification with reference to the recognition signal R at output 10a of Figure 3, described at page 7, line 22 and page 8, lines 11-28.

Summary of Rejections Under 35 U.S.C. §§ 102 and 103

Claims 1-4, 9, 10, 13, 14, 18, and 21-29 are rejected under 35 U.S.C. §102(b) as being anticipated by Jeenicke (U.S. Patent 5,734,224); claims 5, 12, and 17 are rejected under 35 U.S.C. §103(a) as being unpatentable over Jeenicke; claims 6, 7, and 16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Jeenicke, in view of Oguchi (U.S. Pub. 2002/0033047); claim 8 is rejected under 35 U.S.C. §103(a) as being unpatentable over Jeenicke, in view of Oguchi and Woehrl (U.S. Patent 5,173,614); claims 15, 19, and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Jeenicke, in view of Ishiyama (U.S. Patent 6,738,214); and claims 1, 9, 10, 13, and 21 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kirabayashi (U.S. Patent 5,995,892).

In the discussion that follows, when a specific passage of a U.S. patent is cited, it will be indicated by a column number separated from a line number by a colon, e.g., 4:22, indicating column 4, line 22.

Response to Rejections

Claim 1 recites, in part, "first comparison means … supplying a selected logic value when only a first of said acceleration signals is greater than a respective upper threshold,

and supplying the selected logic value when only a second of said acceleration signals is greater than a respective upper threshold." Jeenicke fails to anticipate these limitations of claim 1. The Office Action points to Jeenicke at 3:2-4 as teaching that each of the channels of the embodiment of Figure 3 comprises the evaluators 14, 16 of Figure 1, and that "the longitudinal (10) and transverse (12) acceleration signals are each singly compared against a high threshold and compared together against a lower threshold." Applicants respectfully disagree. The cited text of Jeenicke is presented below in bold, together with the surrounding text, for context:

> The third embodiment, illustrated in FIG. 3, is provided with longitudinal and transverse acceleration sensors 10, 12. Two evaluation channels, channel 1 and channel 2, are provided, and the outputs a_x, a_y from the sensors 10, 12 are fed into each of the evaluation channels 1 and 2. **The channels 1 and 2 may comprise, for example, components 14 and 16 of FIG. 1 or FIG. 2**, and operate in the same way as described in the first and second embodiments respectively, described above. Each channel 1 and 2 can then determine, independently of the other channel, whether the components of the acceleration of the vehicle reach the predetermined threshold values, and in the case of a positive response, each channel outputs a signal d.

Jeenicke, 2:65-3:10.

The quoted text indicates that each channel determines independently of the other channel whether the *components of the acceleration* of the vehicle reach the predetermined threshold values. It *does not* say that either channel compares the transverse component, alone, against the threshold, and on that basis outputs the signal. It is incorrect to assume that each channel is dedicated primarily to a respective one of the longitudinal and transverse acceleration sensors, such that one channel comprises the components 14 and 16 arranged as shown in Figures 1 or 2, and that the other channel comprises the components 14 and 16 arranged *in a mirror arrangement* to that shown in Figures 1 or 2. Instead, it teaches that each channel operates *in the same way* as described in the first and second embodiments. For their parts, neither the first nor the second embodiment evaluates the transverse component independent of the longitudinal component. With regard to the first embodiment, Jeenicke teaches that:

> the output of the evaluation means 16 relating to the transverse acceleration is fed into the evaluation means 14 relating to the longitudinal acceleration. The signal from the evaluation means 16 relating to the transverse acceleration is used to

> change the evaluation algorithm of the evaluation means 14 relating to the longitudinal acceleration.

Id., 2:24-30.

Jeenicke offers no circumstance relating to the first embodiment in which the transverse signal is evaluated separate from the longitudinal signal. The same is true with respect to the second embodiment, regarding which Jeenicke states that, "[a]s before, the *longitudinal acceleration* still forms the basis of calculating whether the actuation capsules 20 are to be actuated." (*Id*, at 2:48-50.)

As noted above, Jeenicke teaches that channels 1 and 2 of the third embodiment operate in the same way as described with reference to the first or second embodiments of Figures 1 or 2, respectively. It is clear that neither of the embodiments of Figures 1 or 2 provides for separate evaluation of the longitudinal acceleration signal, so it follows that the embodiment of Figure 3 does not do so either. Instead, Jeenicke provides the separate channels of the embodiment of Figure 3 as a failsafe mechanism to prevent false detection and deployment of the airbags:

> This arrangement means that the actuation capsules 20 may only be actuated if a signal is received from both of the channels, 1 and 2. This guards against possible mis-evaluation in one of the channels, since the capsules are actuated only if both channels determine that the conditions of acceleration for actuation of the capsules have been met.

Id., 3:19-25.

Jeenicke is directed to a circuit for deploying vehicle airbags. Certainly, it is essential that these devices deploy correctly when it is necessary to prevent or reduce injury from a collision, but it is also nearly as essential that they *not* deploy when such deployment is not necessary, or not likely to prevent or reduce injury. Unexpected deployment, under inappropriate circumstances, can cause personal injuries and has been known to actually cause an accident when it occurs, not to mention the very high expense of replacing a spent airbag. The circuit of Jeenicke's Figure 3 is designed to reduce the likelihood of improper airbag actuation. Jeenicke provides two substantially identical circuits, each with inputs from both sensors. "Each channel … can then determine, independently of the other channel, whether the components of the acceleration of the vehicle reach the predetermined threshold values…. [T]he capsules are

actuated only if both channels determine that the conditions of acceleration for actuation of the capsules have been met." The airbag actuation capsules can only trigger if *both* channels provide an activation signal from the same data, thus virtually eliminating the possibility that a misfire will occur due to a circuit malfunction.

The Examiner's argument requires that the channels 1 and 2 of Jeenicke's Figure 3 operate in opposition to each other. One channel must operate as disclosed with reference to Figures 1 or 2 – in which a purely longitudinal acceleration can provoke actuation, but a purely transverse acceleration can not, while the second channel must function in the opposite manner – it must be capable of producing an actuation signal in response to a purely transverse acceleration, but not in response to a purely longitudinal one. Such an arrangement would be disastrous. Because the circuit requires that both channels must agree before the airbags can be deployed (see 3:19-21), the airbags would not trigger in an event in which there was a direct head-on collision. The transverse sensor would not produce a signal, so the second channel, which would require at least some signal from the transverse sensor, would not output an actuation signal, and the airbags would fail to deploy. Clearly, Jeenicke does not contemplate such an arrangement, and therefore fails to anticipate a means for "supplying a selected logic value when only a first of said acceleration signals is greater than a respective upper threshold *and* supplying the selected logic value when only a second of said acceleration signals is greater than a respective upper threshold." Accordingly, claim 1 is allowable over Jeenicke.

Kirabayashi also fails to teach or suggest all of the limitations of claim 1. The Examiner points to elements of Figures 10, 24, and 25 as collectively teaching many of the elements of claim 1. Kirabayashi fails to teach the limitation of a "second comparison means … for supplying said selected logic value when any two of said acceleration signals are each greater than a respective lower threshold, which is smaller than the respective upper threshold." However, the Examiner argues that "it would have been obvious … to rearrange the threshold values such that V2 and V4 were lower than V1 and V3, since discovering the optimum value of a result effective variable involves only routine skill in the art." Applicants strongly disagree with the Examiner for a number of reasons.

First, the Examiner is attempting to combine embodiments of Kirabayashi that are not compatible. Figure 10 is directed to Kirabayashi's second embodiment (see 12:40), while Figures 24 and 25 are directed to its seventh embodiment (see 26:65, 28:7 and 16). There is no relationship between the longitudinal and lateral sensors 311, 312, 321, 322 of Figures 24, 25 and the circuit or logic of Figure 10, nor can they be combined. While the Examiner's arguments rely on portions of the text describing the device of Figure 10, other portions of that text inconveniently indicate that sensors 11 and 21 of that embodiment are arranged to sense acceleration that is parallel to a *common axis*, as shown in Figure 11, rather than to respective ones of "a plurality of preferential detection axes," as recited in claim 1. The embodiment of Kirabayashi's Figure 10 is directed to a device configured to prevent unnecessary deployment of airbags on one side of the vehicle, in response to a collision from the opposite side, while correctly responding to a right-side collision:

> The acceleration sensors 11 and 21 are located at positions of the same side of the automotive vehicle near the front and rear doors respectively. Accordingly, the air-bag devices can be approximately simultaneously activated upon a collision between that side of the automotive vehicle and an object. In addition, it is possible to prevent the air-bag devices from being activated upon a collision between the other side of the automotive vehicle and an object.

Kirabayashi, 16:13-21.

Kirabayashi also states that "it is preferable that acceleration sensors 11 and 21 are located in a same side of an automotive vehicle," (*Kirabayashi*, 13:12-14), and that "[s]ince the acceleration sensors 11 and 12 are provided at the same side of the automotive vehicle which undergoes the collision, the voltages of the output signals of the acceleration sensors 11 and 21 are approximately equal" (*id.*, 13:25-28). The sensors 11 and 12 can only be expected to provide outputs to a given collision event that are "approximately equal" if they are oriented to sense acceleration that is parallel to a *same axis*. If one or the other were reoriented to sense along a different axis, they would virtually never provide approximately equal signals. Instead, each sensor would respond to the component of acceleration that was parallel to its respective orientation, and the device would not function properly. The operation described with reference to Figures 10-14 provides no teaching or suggestion of "inertial sensor means, which are sensitive to accelerations parallel to said [plurality of] preferential detection axes," but instead

relies upon the parallel orientation of the sensors, and would not function correctly if the sensors were arranged as shown in Figures 24 and 25. Accordingly, a combination of the orientation of the sensors of Figures 24 and 25 with the device of Figure 10 cannot support a *prima facie* showing of unpatentability under § 103. See MPEP § 2143.01, V ("THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE").

Second, while Figures 24 and 25 show longitudinal sensors 311, 321 and lateral sensors 312, 322, there is no teaching or suggestion to supply a logic value when a longitudinal signal and a lateral signal "are each greater than a respective ... threshold," as recited in claim 1. Instead, the longitudinal signals are processed completely separately from the lateral signals, as described with reference to Figure 22 (see 28:33 *et seq.*). It can be seen that while each sensor unit 301, 302 includes a longitudinal sensor and a lateral sensor, as shown in Figures 24 and 25, respectively, the signals of the longitudinal sensors of both sensor units are evaluated together, and the signals of the lateral sensors of both sensor units are evaluated together. At the same time, the signals of the longitudinal sensors are kept entirely isolated from those of the lateral sensors, and are never evaluated together so as to supply a logic value when they "are each greater than a respective ... threshold." Kirabayashi only considers accelerations that occur parallel to common axes for the purpose of producing trigger signals. Thus, the teachings of Kirabayashi with respect to the sensors of Figures 24 and 25 fail to teach or suggest "a plurality of acceleration signals, each of which is correlated to an acceleration parallel to a respective one of [a plurality of] detection axes; ... and second comparison means ... for supplying said selected logic value when any two of said acceleration signals are each greater than a respective lower threshold ...."

Third, if, as argued by the Examiner, one were to rearrange the values of thresholds V2, V4 relative to V1, V3, of the embodiment of Figure 10, Kirabayashi's device would fail to operate properly. In describing the device's response to a wrong-side collision, Kirabayashi notes that the signal from sensor 11 in response to such an impact might reach the lower threshold V1 and V3, "but does not reach the given threshold value V2 in the second sub signal processor 14," and further notes "that the given threshold value V2 is greater than the

given threshold value V1." (*Id.*, at 15:9-12) Likewise, with respect to the output of sensor 21, the wrong-side collision reaches the threshold value V3, "but does not reach the given threshold value V4 in the second sub signal processor 24," because the threshold V4 is higher than the threshold V3 (*see id.*, at 15:18-23). Kirabayashi relies on the settings of the thresholds V1, V3 *relative* to the settings of the thresholds V2, V4 for proper operation of its device. If that relationship were reversed, the device would no longer function as intended. As noted above, a proposed modification cannot render the prior art reference unsatisfactory for its intended use. Thus, even if Kirabayashi's sensors 11 and 21 were sensitive to accelerations parallel to respective ones of a *plurality* of axes, which they are not, or if the embodiment of Figure 10 could be combined with another embodiment teaching such an arrangement, which it cannot, Kirabayashi would still fail to teach or suggest all the limitations of claim 1 because the rearrangement of thresholds suggested in the Office Action would render Kirabayashi's device unsuitable for its intended use.

For all the reasons outlined above, claim 1 is allowable over Kirabayashi.

Claim 9 is allowable over Jeenicke because Jeenicke fails to anticipate "supplying the selected logic value … when only a second one of said acceleration signals is greater than a respective upper threshold" as discussed in detail above. Claim 9 is allowable over Kirabayashi, among other reasons, because it fails to teach or suggest "a plurality of acceleration signals, each of which is correlated to an acceleration parallel to a respective one of said preferential detection axes," and the first and second comparison means connected to the transduction means, as discussed in more detail above.

Additionally, Jeenicke and Kirabayashi each fail to teach or suggest first and second comparison means supplying a selected logic value "at the output terminal." Even if the embodiment of Figure 3 could anticipate "supplying the selected logic value … when only a second one of said acceleration signals is greater than a respective upper threshold," which it can't, it would still produce the selected logic value at separate output terminals, depending on which sensor produced the acceleration signal. As explained above, Jeenicke requires two separate signals to trigger, meaning they must be provided on separate terminals. This is clearly illustrated in Figure 3.

For its part, none of the embodiments of Kirabayashi teach supplying logic signals at a single output terminal. Taking, for example, the embodiment of Figure 10, if the sensor 11 were to generate a signal exceeding threshold V1 while the sensor 21 generated no signal, sub signal processor 13 would produce a signal at its output, and switch 16 would also turn on. Conversely, if the sensor 21 were to generate a signal exceeding threshold V3 while the sensor 11 generated no signal, sub signal processor 23 would produce a signal at its output, and switch 26 would turn on. The output terminals of processors 13 and 23 are separate, as are their respective switches. Clearly, there is no common output terminal, nor is there any such suggestion. In this respect, all of Kirabayashi's embodiments are similar to that of Figure 10. For at least the reasons outlined above, claim 9 is allowable over Jeenicke and Kirabayashi.

Jeenicke fails to anticipate "a logic circuit configured to produce a selected logic value at an output if the dynamic acceleration signal of only a first one of the plurality of detection axes exceeds its respective higher threshold, [and] if the dynamic acceleration signal of only a second one of the plurality of detection axes exceeds its respective higher threshold," as recited in claim 13.

Kirabayashi fails to teach or suggest "an acceleration circuit configured to produce a dynamic acceleration signal corresponding to a level of acceleration in each of a plurality of detection axes; … and a logic circuit configured to produce a selected logic value at an output … if the dynamic acceleration signals of any two of the plurality of detection axes exceed their respective lower thresholds," as recited in claim 13.

For at least these reasons, claim 13 is allowable over Jeenicke and Kirabayashi.

Claims 10 and 21 are each allowable over Jeenicke and Kirabayashi for some or all of the reasons outlined above with respect to claims 1, 9, and 13.

<u>Conclusion</u>

Overall, the cited references do not singly, or in any motivated combination, teach or suggest the claimed features of the embodiments recited in independent claims 1, 9, 10, 13, or 21, and thus such claims are allowable. Applicants' decision not to argue the allowability of

each of the dependent claims is not to be construed as an admission that such claims would not be allowable but for their dependence on allowable base claims, and Applicants reserve the right to present such arguments as may become necessary in the future. If the undersigned representative has overlooked a relevant teaching in any of the references, the Examiner is requested to point out specifically where such teaching may be found.

In light of the above amendments and remarks, Applicants respectfully submit that all pending claims are allowable, and therefore request that the Examiner reconsider this application and timely allow all pending claims. Examiner Amrany is encouraged to contact Mr. Bennett by telephone at (206) 694-4848 to discuss the above and any other distinctions between the claims and the applied references, and to address any informalities that may remain unresolved.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,

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